The opinion in support of the decision being entered today was ***not*** written for publication and is ***not*** binding precedent of the Board.

Paper No. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex Parte JOSEPH KAELLIS

Appeal No. 2004-1037
Application No. 09/680,387

ON BRIEF

Before GARRIS, DELMENDO and JEFFREY T. SMITH, ***Administrative Patent Judges.***

JEFFREY T. SMITH, ***Administrative Patent Judge***.

DECISION ON APPEAL

Applicant appeals the decision of the Primary Examiner's refusal to allow claims 11, 12, 15, 18 and 20, all of the pending claims.[1] We have jurisdiction under 35 U.S.C. § 134.

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[1] In rendering our decision, we have considered Appellant's arguments presented in the Brief, filed May 5, 2003.

THE INVENTION

The Appellant's claimed invention relates to a heat exchanger having a tube bundle inside of a shell. The tubes have mini-vortex generators comprising ridge members that encircle at least a portion of the exterior surface of tube. According to Appellant, "[t]he mini-vortex generators function to abruptly interrupt the flow of the shell fluid proximal to the exterior surface of the tube." (Brief, p. 2). Claim 11 which is representative of the invention is reproduced below:

> 11. A heat exchanger comprising:
>
> (a) a shell;
>
> (b) a tube bundle inside the shell, the tube bundle comprising a plurality of substantially parallel tubes for passage of a first fluid, each tube having a base diameter of between about 0.5" and about 1", at least a portion of the tubes having on their exterior surface mini-vortex generators comprising two or more ridge members that encircle at least a portion of the exterior surface of a tube, the height of each ridge member being between about 0.2 mm and about 1.0 mm, the spacing between any two ridge members being between about 2 mm and about 40 mm;
>
> (c) a sinuous baffle for supporting the tubes, the sinuous baffle comprising a plurality of wiggle bar tube support members disposed between the tubes;
>
> (d) a tube inlet for passage of the first fluid into the tubes and a tube outlet for passage of the first fluid out of the tube;

> (e) a shell outlet for passage of a second fluid into the shell and exterior of the tubes and a shell outlet for withdrawing a second fluid from the shell, wherein the first and second fluid are passed either countercurrent, co-current, or in multi-pass substantially parallel flow, and when the fluids are at different temperatures, a transfer of heat occurs between the fluids.

As evidence of unpatentability, the Examiner relies on the following references:

Pettigrew	3,837,397	Sept. 24, 1974
McClintock	4,588,027	May 13, 1986

THE REJECTION

The Examiner rejected claims 11, 12, 15, 18 and 20 under 35 U.S.C. § 103(a) as obvious over the combination of McClintock and Pettigrew. (Answer, pp. 3-4).

OPINION

Upon careful review of the respective positions advanced by Appellant and the Examiner, we find ourselves in agreement with Appellant's position in that the Examiner has failed to carry the burden of establishing a ***prima facie*** case of obviousness. ***See In re Oetiker,*** 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); ***In re Piasecki,*** 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). Accordingly, we will not sustain the Examiner's rejection. We will limit our discussion to claim 11, the sole independent claim on appeal.

We find claim 11 is directed to a heat exchanger that comprise tubes wherein the exterior surface of the tubes comprises two or more ridge members that encircle at least a portion of the exterior surface of a tube. The height of each ridge member is between about 0.2 mm and about 1.0 mm. The ridge members are spaced between about 2 mm and about 40 mm. The heat exchanger also comprises a sinuous baffle for supporting the tubes. The sinuous baffle comprises a plurality of wiggle bar tube support members disposed between the tubes.

The Examiner rejects the subject matter of claim 11 over the combination of McClintock and Pettigrew. According to the Examiner, McClintock teaches a heat exchanger that comprises all of the components except for the height and spacing of the ridge members and the sinuous baffle (Answer, p. 3). The Examiner relied on the Pettigrew reference for teaching a heat exchanger with sinuous baffles which minimize the spacing of the tubes. (Answer, p. 3). The Examiner concluded that it would have been obvious to use a sinuous baffle to minimize the spacing of the tubes in the heat exchanger of McClintock. The Examiner also concluded that it would have been obvious to employ any ridge spacing to achieve a desired pressure drop or heat transfer efficiency. Further, the Examiner concluded that it would have been obvious to optimize the height of McClintock's ridge members. (Answer, p. 4).

We reverse. We agree with the Appellant, Brief page 7, that the fins (ridge members) of McClintock serve a different purpose. The fins of McClintock function to interlock with the rod serrations creating tension and compression forces to support the tubes in place and prevent vibration. (Col. 2, ll. 33-36). The Examiner has not directed us to evidence that the optimization of the height of the fins of McClintock for preventing vibration would necessarily result in the creation of mini-vortex generators as required by claim 11.

We also agree with Appellant that a person of ordinary skill in the art would not have been motivated to combine the teachings of the McClintock and Pettigrew references. (Brief, pp. 9-11). The Examiner asserts that there is no difference between the claimed wiggle bar tube support member and the sinuous baffle disclosed by Pettigrew. (Answer, p. 6). We do not agree. McClintock uses the serrated rods (21) to interlock with the fins on the tubes for support and to prevent vibration. The Examiner has not addressed whether the combination of McClintock and Pettigrew would employ a sinuous baffle that has serrations. The Examiner also has chosen not to address the Appellant's argument, Brief, page 11, that if McClintock's rods had sinusoidal waves that the rods could not be inserted or rotated to engage with the fins of the tubes.

For the foregoing reasons and those stated in the Brief, we determine that the Examiner's conclusion of obviousness is not supported by facts. "Where the legal conclusion [of obviousness] is not supported by facts it cannot stand." ***In re Warner,*** 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967).

CONCLUSION

The rejection of claims 11, 12, 15, 18 and 20 under 35 U.S.C. § 103(a) over the combination of McClintock and Pettigrew is reversed.

REVERSED

BRADLEY R. GARRIS ***Administrative Patent Judge***	)
ROMULO H. DELMENDO ***Administrative Patent Judge***	) **BOARD OF PATENT**) **APPEALS AND**) **INTERFERENCES**
JEFFREY T. SMITH ***Administrative Patent Judge***	)

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